REMARKS

Continued examination and favorable reconsideration are respectfully requested.

Claims 20-44 remain pending in this application. By this Amendment, claims 20 and 33 have been amended. Claims 1-19 were previously canceled.

Examiner Interview Conducted April 24, 2007

The applicants sincerely thank the Examiner for the courtesies extended during the Examiner interview conducted April 24, 2007. At that interview, the Examiner advised that certain amendments to claims 20 and 33, including reference to a "photodetector" and a "separately scaled representation of at least one of the two identifiable signals" as detailed herein, would be sufficient to address and overcome the pending rejections of the claims, for which indication applicants express appreciation.

Rejection of the Claims under 35 U.S.C. § 102(b)

At page 2 of the Office Action, claims 20-24 and 33-36 are rejected under 35 U.S.C. §102(b), as being anticipated by Morris (Nuclear Magnetic Resonance Imaging in Medicine and Biology, 1986, Oxford: Clarendon Press). For the reasons set forth herein, Applicants respectfully traverse this rejection. Reconsideration and withdrawal of the rejection are respectfully requested.

Claim 20 relates to a method for improving the measurement of one or more types of specific particles of a sample by detecting associated identifiable signals, including features of "performing a first measurement of the identifiable signals" with a "photodetector at a first configuration," the first configuration including a "first operating parameter," and "performing a second measurement of the identifiable signals" with a "photodetector at a second

configuration," the second configuration including a "second operating parameter." According to various embodiments of the invention claimed in claim 20, the first and second configurations can include or relate to the dynamic detection range of the detector, so that, for instance, the gain, sensitivity, or exposure of the photodetector can be adjusted to be high enough to detect relatively low-level signals. Conversely, according to various embodiments the gain, sensitivity, or exposure of the photodetector can be reduced while detecting relatively high-level signals. Claim 20 further includes features of "adjusting one of the first and second output signals based on a relationship between the first and second parameters to obtain a separately scaled representation of at least one of the two identifiable signals...." According to various embodiments of the invention claimed in claim 20, the method can therefore compensate or adjust for those varying signal conditions.

Claim 20 includes the additional features of "generating effective representations of the first and second types of the specific particles to thereby allow improved identification of the specific particles within the sample." The representations of the first and second types can be improved, for example, with regard to signals that might be overloaded at high gain, sensitivity, or exposure settings used to detect the lower-level signals, or vice versa. Better detection accuracy can therefore be achieved.

Morris fails to identically describe the method of claim 20. Morris describes techniques in the field of nuclear magnetic resonance (NMR) imaging by which a detected off-resonance phase quadrature signal can be compared to two different fixed-phase references to increase detected SNR. *See*, e.g., Morris, at page 34.

Morris fails to describe or suggest the method claimed in claim 20, including use of a "photodetector" for detection. The detection of Morris is the detection of a precessing magnetic

signal, in NMR applications. Signal detection does not take place in the optical domain in Morris. Moreover, the magnetic detection of Morris takes two (phase-altered or shifted) detection images through two phase-sensitive detector systems (p.s.d.s.) of the same original signal source, but not separate signals related to a separate "first type" and "second type" of particles, as in claim 20.

Morris yet further fails to disclose or suggest "adjusting one of the first and second output signals based on a relationship between the first and second parameters to obtain a separately scaled representation of at least one of the two identifiable signals...," as in claim 20. When the two phase-shifted detection signals are detected, Morris merely describes combining those two components to produce an enhanced (increased by the square root of 2) SNR signal, rather than generating or obtaining a "separately scaled representation" of at least one of those signals (emphasis added). Lacking these and other features of the claimed invention, claim 20 distinguishes over Morris and the rejection of claim 20 under 35 U.S.C. §102(b) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn.

Claims 21-24 distinguish over Morris for at least the same reasons as claim 20, from which they depend, does. The rejection of those claims under 35 U.S.C. §102(b) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn.

Claim 33 recites a method of extending the effective dynamic range of a photodetector that measures detectable signals from a sample undergoing a biological analysis, wherein the detectable signals comprise two or more components representative of two or more components of the sample. Claim 33 includes features of "obtaining a first output signal from the photodetector operated at a first configuration that allows effective measurement of a first component of the detectable signals," as well as "obtaining a second output signal from the

photodetector operated at a second configuration that allows effective measurement of a second component of the detectable signals wherein the second configuration is such that the first component of the detectable signals would fall outside the photodetector's dynamic range at the second configuration."

Claim 33 likewise includes features of "scaling separately the first output signal to a scale associated with the second configuration wherein the amount of scaling depends on the first and second configurations and wherein the separately scaled first output signal allows the generation of a representation of the first output signal at the second configuration thereby extending the effective dynamic range of the photodetector and wherein such extension of the effective dynamic range allows improved characterization of the sample having a relatively large range of relative abundances of the two or more components."

Morris fails to identically describe the method of claim 33, including use of a "photodetector" rather than a magnetic signal detector, and features of "obtaining a first output signal" and "obtaining a second output signal from the photodetector operated at a second configuration that allows effective measurement of a second component of the detectable signals wherein the second configuration is such that the first component of the detectable signals would fall outside the photodetector's dynamic range at the second configuration." As noted above, any signal manipulation in Morris relates to increasing effective SNR by combining phase-shifted signals from the same magnetic signal source, but not configurations that adjust to detect signals that "would fall outside the photodetector's dynamic range" at a second, different configuration.

Morris, moreover, entirely fails to disclose, suggest, or recognize any possibility of "scaling separately the first output signal to a scale associated with the second configuration wherein the amount of scaling depends on the first and second configurations and wherein the

separately scaled first output signal allows the generation of a representation of the first output signal at the second configuration thereby extending the effective dynamic range of the photodetector and wherein such extension of the effective dynamic range allows improved characterization of the sample having a relatively large range of relative abundances of the two or more components." Morris does not separately scale the phase-shifted NMR signals that reference is concerned with, nor perform any manipulation resulting in extended dynamic range that allows improved characterization of the sample having a relatively large range of relative abundances. Lacking these and other features of the claimed invention, claim 33 distinguishes over Morris and the rejection of claim 33 under 35 U.S.C. §102(b) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn.

Claims 34-36 distinguish over Morris for at least the same reasons as claim 33, from which they depend, does. The rejection of those claims under 35 U.S.C. §102(b) is also overcome. The rejection is respectfully traversed. The rejection should be withdrawn.

Rejection of the Claims under 35 U.S.C. § 103

At page 6 of the Office Action, claims 20-30 and 33-42 are rejected under 35 U.S.C. §103(a), over Morris in view of Churchill et al. (IEEE Transactions on Aerospace and Electronic Systems, Volume AES-17, no. 1, 1981) in view of Pierre et al. (IEEE Transactions on Aerospace and Electronic Systems, 1995 pages 1900-1902) and further in view of Tacklind et al. (U.S. Patent Application Publication No. 2003/0101605 A1). For the reasons set forth herein, Applicants respectfully traverse this rejection. Reconsideration and withdrawal of the rejection are respectfully requested.

Claim 20 distinguishes over Morris for at least all the reasons discussed above, including

features of detection using a "photodetector," detection of a "first type" and "second type" of particles, and "adjusting one of the first and second output signals based on a relationship between the first and second parameters to obtain a separately scaled representation of at least one of the two identifiable signals...." Churchill et al., Pierre et al., and Tacklind et al. fail to disclose or suggest any more of the invention of claim 20 than Morris. Neither Morris, Churchill et al., Pierre et al., Tacklind et al., nor any combination thereof, even if such combination were proper, discloses or suggests a method as claimed in claim 20, including use of a photodetector, first and second output signals as recited, and obtaining a separately scaled representation as recited. The rejection of claim 20 under 35 U.S.C. §103(a) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn. Claims 21-30 distinguish over Morris, Churchill et al., Pierre et al., Tacklind et al., and any combination thereof, even if such combination were proper, for at least the same reasons as claim 20, from which they depend, does. The rejection of those claims under 35 U.S.C. §103(a) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn.

Claim 33 distinguishes over Morris for at least all the reasons discussed above, including the failure of Morris to include the claimed features of detection using a "photodetector," detection of a "first type" and "second type" of output signal, and detection of a second type in a fashion that "allows effective measurement of a second component of the detectable signals wherein the second configuration is such that the first component of the detectable signals would fall outside the photodetector's dynamic range at the second configuration." Claim 33 further includes the features of "scaling separately the first output signal to a scale associated with the second configuration wherein the amount of scaling depends on the first and second configurations and wherein the separately scaled first output signal allows the generation of a

representation of the first output signal at the second configuration thereby extending the effective dynamic range of the photodetector and wherein such extension of the effective dynamic range allows improved characterization of the sample having a relatively large range of relative abundances of the two or more components." These features are completely lacking in Morris. Churchill et al., Pierre et al., and Tacklind et al. fail to disclose or suggest any more of the invention of claim 33 than Morris. Neither Morris, Churchill et al., Pierre et al., Tacklind et al., nor any combination thereof, even if such combination were proper, discloses or suggests a method as claimed in claim 33, including use of a photodetector, detection of first and second output signals as recited, and obtaining a separately scaled representation as recited. The rejection of claim 33 under 35 U.S.C. §103(a) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn. Claims 34-42 distinguish over Morris, Churchill et al., Pierre et al., Tacklind et al., and any combination thereof, even if such combination were proper, for at least the same reasons as claim 33, from which they depend, does. The rejection of those claims under 35 U.S.C. §103(a) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn.

At page 12 of the Office Action, claims 20-24, 28-36, and 40-44 are rejected under 35 U.S.C. §103(a), over Morris (Nuclear Magnetic Resonance Imaging in Medicine and Biology, 1986, Oxford: Clarendon Press) in view of Churchill et al. (IEEE Transactions on Aerospace and Electronic Systems, Volume AES-17, no. 1, 1981), in view of Pierre et al. (IEEE Transactions on Aerospace and Electronic Systems, 1995 pages 1900-1902), in view of Tacklind et al. (U.S. Patent Application Publication No. 2003/0101605 A1), and further in view of Photomultiplier Tubes (Hamamatsu Brochure, pages 1-15, July 2002). For the reasons set forth herein, Applicants respectfully traverse this rejection. Reconsideration and withdrawal of the rejection are

respectfully requested.

Claim 20 distinguishes over Morris for at least all the reasons discussed above, including the features of detection using a "photodetector," detection of a "first type" and "second type" of particles, and "adjusting one of the first and second output signals based on a relationship between the first and second parameters to obtain a separately scaled representation of at least one of the two identifiable signals...." Churchill et al., Pierre et al., Tacklind et al., and Photomultiplier Tubes fail to disclose or suggest any more of the invention of claim 20 than Morris. Neither Morris, Churchill et al., Pierre et al., Tacklind et al., Photomultiplier Tubes, nor any combination thereof, even if such combination were proper, discloses or suggests a method as claimed in claim 20, including use of a photodetector, detection of first and second output signals as recited, and obtaining a separately scaled representation as recited. The rejection of claim 20 under 35 U.S.C. §103(a) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn. Claims 21-24 and 28-32 distinguish over Morris, Churchill et al., Pierre et al., Tacklind et al., Photomultiplier Tubes, and any combination thereof, even if such combination were proper, for at least the same reasons as claim 20, from which they depend, does. The rejection of those claims under 35 U.S.C. §103(a) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn.

Claim 33 distinguishes over Morris for at least all the reasons discussed above, including features of detection using a "photodetector," detection of a "first type" and "second type" of output signal, and detection of a second type in a fashion that "allows effective measurement of a second component of the detectable signals wherein the second configuration is such that the first component of the detectable signals would fall outside the photodetector's dynamic range at the second configuration." Claim 33 further includes features of "scaling separately the first output

signal to a scale associated with the second configuration wherein the amount of scaling depends on the first and second configurations and wherein the separately scaled first output signal allows the generation of a representation of the first output signal at the second configuration thereby extending the effective dynamic range of the photodetector and wherein such extension of the effective dynamic range allows improved characterization of the sample having a relatively large range of relative abundances of the two or more components." These features are completely lacking in Morris. Churchill et al., Pierre et al., Tacklind et al., and Photomultiplier Tubes fail to disclose or suggest any more of the invention of claim 33 than Morris. Neither Morris, Churchill et al., Pierre et al., Tacklind et al., Photomultiplier Tubes, nor any combination thereof, even if such combination were proper, discloses or suggests a method as claimed in claim 33, including use of a photodetector, detection of first and second output signals as recited, and obtaining a separately scaled representation as recited. The rejection of claim 33 under 35 U.S.C. §103(a) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn. Claims 34-36 and 40-44 distinguish over Morris, Churchill et al., Pierre et al., Tacklind et al., Photomultiplier Tubes, and any combination thereof, even if such combination were proper, for at least the same reasons as claim 33, from which they depend, does. The rejection of those claims under 35 U.S.C. §103(a) is overcome. The rejection is respectfully traversed. The rejection should be withdrawn.

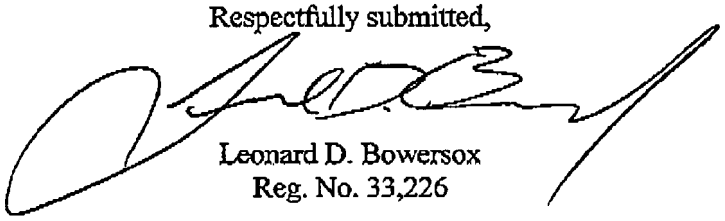
CONCLUSION

In view of the foregoing remarks, Applicants respectfully request favorable reconsideration of the present application and a timely allowance of the pending claims.

Should the Examiner deem that any further action by Applicants or Applicants' undersigned representative is desirable and/or necessary, the Examiner is invited to telephone the undersigned at the number set forth below.

If there are any other fees due in connection with the filing of this response, please charge the fees to deposit Account No. 50-0925. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,



Leonard D. Bowersox
Reg. No. 33,226

Scott D. Balderston
Reg. No. 35,436

KILYK & BOWERSOX, P.L.L.C.
3603-E Chain Bridge Road
Fairfax, Virginia 22030
Tel.: (703) 385-9688
Fax: (703) 385-9719